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WATER

FACTS ABOUT

MWRA

METROWEST WATER SUPPLY TUNNEL

A MASSACHUSETTS WATER RESOURCES AUTHORITY PUBLICATION - FALL 1996

A turn of the faucet is the journey's end for water traveling halfway across the Commonwealth to the homes of nearly 2.5 million people and 5,500 businesses in communities served by MWRA.

Because water is so important to everyone's daily life, maintaining a reliable water system is an important element of our work. MWRA operates an elaborate system of nearly 400 miles of water tunnels and water distribution mains, which feed into another 6,700 miles of water distribution pipes owned and operated by individual communities. Last updated in 1940, this system is in its sixth decade of service and is in great need of repair.

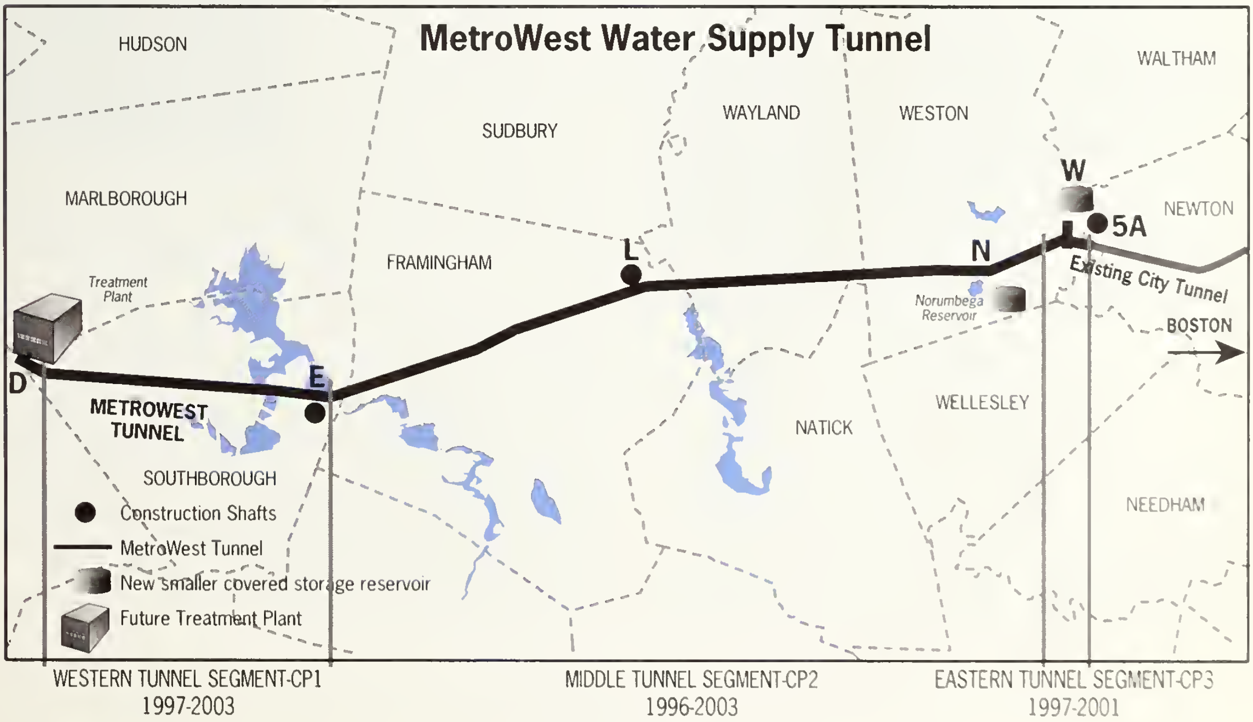
To avert the potential damage caused by a major break or failure of this system and to provide the missing redundancy that this region needs for basic health and safety reasons, MWRA is building a new aqueduct, the MetroWest Water Supply Tunnel (MWWST). Constructing this essential project over the next seven years will enable MWRA to upgrade its water transmission system, which was designed in the late 19th century, into a 21st century system that will serve Massachusetts residents for decades to come.

This brochure provides some background on the current system and outlines plans for the new system.

THE HULTMAN AQUEDUCT

The Hultman Aqueduct is currently the backbone of MWRA's water transmission system, delivering water from MWRA's two source reservoirs - the Quabbin and the Wachusett.

This surface pipeline stretches 17.8 miles from the western edge of Southborough through the Norumbega Reservoir in the town of Weston to the I-90/128 intersection on the Newton/Weston



line where it connects to the City Tunnel. Completed in 1940, the Hultman was supposed to be the first half of a double-barrel water main, but the advent of World War II prevented the other half from being built.

Today, greater Boston is the only major American metropolitan area to rely on a single water supply conduit to deliver 85% of its drinking water. Without a back-up system in place, routine repairs and proper maintenance work can not be done, leaving the Hultman in a steadily deteriorating state. Its structural integrity is diminishing: aging valves and joints, corroding steel and concrete and leaks are just a few of the problems. The older the pipe gets, the greater the possibility of a critical break or failure with serious public health and economic consequences.

The economic impact of a water supply interruption could be $65 to $100 million per day, according to experts. Moreover, the risk to public health and public safety could not be measured in monetary terms.

PLANNING FOR THE MWWST

The deferred construction of the second pipe continued into the 1980s, when the Metropolitan District Commission (MDC) resumed planning for improved water system reliability. In 1985, MWRA continued those studies. In 1990, upon evaluating the costs and environmental impacts of various options with the help of design firm Sverdrup Civil Inc., concluded that a hard rock tunnel would be the best approach.

> "Building a second aqueduct to insure the flow of drinking water to 2.5 million residents of Boston, Quincy and 37 other communities in Boston is a necessity that must not be put off."
>
> **Patriot Ledger editorial, July 14, 1995**

Plans commenced to build the 17.6 mile-long, 14-foot diameter MWWST to provide a means of delivering future redundancy, reliability and confidence to the customers that depend on MWRA water services every day.

The Environmental Review Process began in 1990 and continued through 1995. In June, 1995, the MWRA contracted Boston-based firm Stone and Webster Engineering Corporation to provide construction management and resident engineering and inspection services for the project. On December 13, 1995 the MWRA Board of Directors gave unanimous approval to begin the bidding for construction of the tunnel.

MWWST WILL ANCHOR SYSTEM

The MWWST is the anchor of the MWRA's extensive Waterworks Capital Improvement program. The deep rock tunnel approach has set the foundation for many other decisions about cost-effective upgrades to other components of the water system.

In addition to providing redundancy to the Hultman Aqueduct, the MWWST will also benefit the Weston Aqueduct, which carries the remaining 15% of MWRA water. The MWWST will have an increased capacity over the Hultman of up to 450 million gallons a day. This will enable the Weston Aqueduct and the Weston Reservoir to be taken off-line and placed on emergency stand-by status, avoiding expensive rehabilitation of the Weston Aqueduct.

The MWWST will allow distribution storage projects, like the Norumbega Covered Storage Project, to be smaller, with construction less costly and less environmentally burdensome to neighbors. With the tunnel on-line, summer water peaks and fire protection demands will be satisfied without resorting to opening distribution reservoirs or old brick aqueducts.

Description
CP-1. Western Tunnel Segment, Shafts D, E 4.7 miles of tunnel, pressure tests from D to E and surface connections at Shaft E
CP-2. Middle Tunnel Segment, Shafts L, N 11.9 miles of tunnel plus surface piping at Shaft L and N
CP-3. Eastern Tunnel Segment, Shafts 5A, W 0.9 miles of tunnel, connection to City Tunnel
CP-4. Surface Piping Work at Shaft N Pipeline and intake structure connecting Shaft N of the MWWST to existing Norumbega Reservoir and all other work requiring sub-bids under M.G.L.
CP-5. MHD Salt Sheds Construction of new salt shed in Weston for Mass. Highway Department and demolition of old sheds to facilitate construction of Shaft 5A
CP-6. Hultman Interconnects/Inspection Inspection/rehabilitation of Hultman and connection to the MWWST at Shafts L, 5A, N and E
CP-7. Testing and Disinfection Pressure testing MWWST from E to W and 5A and disinfection of entire MWWST
CP-8. Weston Covered Storage Tanks Twenty million gallons of Covered Storage and surface piping at Shaft W

Construction of the tunnel will have a positive impact on the local economy. Many hundreds of full or part-time jobs will be directly generated by the project. These jobs will be in construction, engineering and professional services, as well as in related industries.

CONSTRUCTION OF THE MWWST

The MWWST is a 7-year, $728 million project. Costs include design, construction, inflation and a reserve for contingencies. The tunnel will traverse 5 communities: Framingham, Marlborough, Southborough, Wayland and Weston. It will be excavated 200-500 feet below ground surface utilizing at least 3 modern tunnel boring machines. The first two, being built by the Robbins Company, are scheduled to arrive in June, 1997. There will be 3 major construction shafts: E (Southborough) L (Framingham), and 5A (Weston), plus 7 smaller raise-bored shafts. The tunnel will be constructed from the end of the Cosgrove Aqueduct in Marlborough (Shaft C) to the beginning of the of the City Tunnel (Shaft 5).

Eight separate construction contracts make up the entire project. The first and largest $252 million contract was awarded in May 1996, to the joint venture of Shea-Traylor-Healy of Walnut, California to construct the middle 11.9 miles of tunnel. Notice to proceed was given on June 17, 1996 and significant work has been accomplished since.

nish sign	Start Construction	Substantial Completion
V 96	MAR/APR 97	MAR 03
N 96	JUN 96	FEB 03
B 97	AUG 97	SEP 01
T 99	APR 00	NOV 01
N 96	SEP 96	AUG 97
N 04	JUL 04	JUL 05
P 02	MAY 03	JAN 04
R 97	SEP 97	OCT 99

CONSTRUCTION AT SHAFT L (FRAMINGHAM)

Shaft L is the main construction staging area, located on 27 acres of land leased from the New England Sand and Gravel (NESG) Company in Framingham. It is the construction shaft site for the middle 11.9 miles of tunnel that are part of the Shea-Traylor-Healy contract, as well as the main headquarters for Stone and Webster's construction management team.

Over the life of the project, approximately 1.4 million cubic yards of tunnel rock will be removed. Of that, 850,000 cubic yards will be removed from Shaft L. Roughly 680,000 cubic yards will stay on site and be used for backfill throughout the NESG property. The remaining material will be trucked off the site by NESG at a maximum rate of 100,000 cubic yards per year.

> "WORK IS UNDERWAY, ALBEIT, RELATIVELY QUIETLY."
>
> **JOHN MCMAHON, DIRECTOR OF FRAMINGHAM PUBLIC WORKS**
> **MIDDLESEX NEWS, AUGUST 20, 1996**

In an agreement between MWRA and the town, a Framingham Fire Department deputy chief will be stationed at the site full-time to coordinate safety issues, including permits, blasting and tunnel rescue. Security will be present on a 24 hour-a-day basis.

STATE FUNDING

Over the past several years, the MWRA Legislative Caucus has aggressively pursued state assistance for this project. Their efforts were successful in June, 1996, when state debt service was extended to include $310,000 in rate relief for the MWWST for fiscal year 1997. This state funding validates how important the project is to the metro-Boston region and the entire state. Debt service assistance has been a source of sewer rate relief over the past several years. Having made the assistance available to this water improvement project will directly benefit ratepayers.

PUBLIC PARTICIPATION

MWRA has established a comprehensive, long-term public participation process for the MWWST project to inform the public of the project's value and to address community concerns related to design and construction activity. Local working groups have been formed around the three major construction shaft sites in Framingham, Weston and Southborough. As MWRA progressed through the environmental review and design phase for the project, countless public meetings were held, scores of comments were solicited and hundreds of decisions and involvement has been invaluable. The following areas of concern have been identified and resolved through this process:

- Construction traffic
- Off-site disposal of excavated materials
- On-site disposition of excavated materials
- Site runoff and drainage
- Wetlands
- Noise and vibration
- Air quality
- Water supply contingency plan
- Hazardous waste/Contaminated materials
- Historic and archaeological resources
- Fire, safety and rescue

> "WORKING GROUP MEMBERS HAVE WORKED LONG AND HARD ON THE AGREEMENT, AND THE MWRA HAS BEEN BOTH PATIENT AND COOPERATIVE WITH THE TOWN. IT'S TIME WE LET THEM DIG THEIR TUNNEL."
>
> **MIDDLESEX NEWS EDITORIAL, FEBRUARY 10, 1996**

Although this public participation process involves numerous people with varied interests, it has been enormously successful, and agreements are being negotiated and developed for all of the above areas of concern. A Memorandum of Agreement (MOA) with Framingham was finalized on February 7, 1996, and a MOA with Wayland was signed on October 16, 1996. The MOAs with Southborough and Weston will soon be finalized.

One mitigation measure to be included in all MOAs is the establishment of a 24-hour hotline number for the convenience of public officials and local residents with questions, concerns or complaints. The number to call is:

1-888-TUNNEL2, or (1-888-886-6352).

Each contractor is required by the contract specifications to comply with the MOAs. Stone and Webster personnel will enforce the community agreements by monitoring all construction activity. Continued coordination between MWRA and the working groups will help resolve any problems or concerns that may arise during project construction. As the project progresses, meetings will be held in each impacted community prior to construction and periodically throughout the construction phase. Constant communication at all levels and the rapid response time in dealing with issues have shown that large public improvement projects can be built in host communities by giving citizen interest groups, municipal officials and other interested parties a place at the table.

By committing to effective mitigation measures and community agreements, MWRA has endeavored to avoid or minimize the adverse impacts of the project on the towns and the environment while being sensitive to cost control concerns.

MWRA COMMUNITIES TO BENEFIT FROM THE METROWEST WATER SUPPLY TUNNEL:

Arlington
Bedford
Belmont
Boston
Brookline
Cambridge
Canton
Chelsea
Everett
Framingham
Lexington
Lynn
Lynnfield
Malden
Marblehead
Marlborough
Medford
Melrose
Milton
Nahant
Needham
Newton
Norwood
Peabody
Quincy
Revere
Saugus
Somerville
Southborough
Stoneham
Swampscott
Wakefield
Waltham
Watertown
Wellesley
Weston
Winchester
Winthrop
Woburn

The MWRA offers a wide variety of informational materials on the region's water and sewer systems and the natural environment.

To find out what's available, contact the MWRA Public Affairs Department at **617-241-6057**,

E-Mail to twatkins @ **mwra.state.ma.us** or write to:

PUBLIC INFORMATION UNIT Massachusetts Water Resources Authority
Charlestown Navy Yard • 100 First Avenue • Boston MA 02129